



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8**

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APR 02 2012

Ref: 8EPR-N
Shelly Dyke, Team Leader
Fishlake National Forest
115 E 900 N
Richfield, UT 84701

Re: Draft Environmental Impact Statement for
Oil and Gas Leasing on the Fishlake
National Forest: CEQ # 20110353

Dear Ms. Dyke:

The United States Environmental Protection Agency Region 8 (EPA) has reviewed the Draft Environmental Impact Statement (EIS) prepared by the U.S. Department of Agriculture Forest Service (Forest Service) for oil and gas leasing on the Fishlake National Forest. Our comments are provided for your consideration pursuant to our responsibilities and authority under Section 102(2)(C) of the National Environmental Policy Act (NEPA), 42 U.S.C. Section 4332(2)(C), and Section 309 of the Clean Air Act, 42 U.S.C. Section 7609.

Project Background

The Proposed Action considered in the NEPA analysis would make all lands administered by the Fishlake National Forest available for oil and gas leasing. In addition to a No Action/No Leasing alternative (Alternative A), three leasing alternatives are analyzed, which differ in terms of the types of leasing restriction under which leasing could occur. Under Alternative B, all lands legally open to oil and gas leasing would be administratively available for leasing with standard lease terms and conditions. Alternative C, the Preferred Alternative, applies No Surface Occupancy (NSO), Controlled Surface Use (CSU) or Timing Limitation (TL) stipulations to certain sensitive areas, while making the remainder of the forest available for leasing under standard lease terms and conditions. Alternative D emphasizes the protection of non-mineral resources and uses over oil and gas exploration and development activities and applies the greatest restrictions on oil and gas leasing availability and stipulations. The reasonably foreseeable development (RFD) scenario for the Preferred Alternative predicts development of 43 exploratory wells and 30 production wells on leases within the Forest.

EPA's Comments and Recommendations

The EPA's comments included in this letter focus on the key topics of air quality, wetlands and surface water resources, and protection of drinking water. Along with an explanation of these comments, we offer recommendations on how the Forest Service might address them. We have also provided the enclosed "EPA Detailed Comments," which includes additional detail pertaining to these issues as well as addresses concerns regarding climate change and environmental justice (Attachment 1).

A. Air Quality

Air quality is an important concern for oil and gas leasing and potential future development on the Fishlake National Forest due to the proximity of sensitive airsheds. Capitol Reef National Park, a federal Class I area, borders the Forest, while two additional Class I areas, Bryce Canyon and Zion National Parks, are within 60 miles of the Forest. There are also five sensitive Class II areas within or near to Fishlake National Forest.

To assess potential impacts to air quality, the Forest Service prepared a screening-level modeling analysis for both the Dixie and Fishlake National Forests (Oil and Gas Leasing on Lands Administered by the Dixie National Forest Final EIS, August 2011). This screening-level analysis identifies when additional refined air quality modeling would be necessary in the future to evaluate the potential impacts of development. The Forest Service consulted with the EPA during the modeling analysis, completed in February 2010 for the Dixie and Fishlake National Forests.

1) Insufficient Mitigation to Protect Air Quality.

The Draft EIS predicts potential impacts to sensitive airsheds for exploratory or production field development impacts, including visibility impairment and pollutant concentrations exceeding the Class I increment. Detailed requirements for emissions controls and future modeling analyses are therefore important for oil and gas development in the Fishlake National Forest to prevent potential adverse impacts to visibility or criteria pollutant concentrations in Class I or sensitive Class II areas. To more clearly define the level of protection afforded by “appropriate Best Available Control Technology” to be implemented through the CSU stipulation to protect Class I airsheds, we strongly recommend that the Final EIS include a minimum set of emissions control requirements. In addition to the requirement in the CSU stipulation for an air impact analysis to be conducted prior to any field development within 60 km of a Class I airshed, we suggest the Final EIS define additional specific conditions under which an air impact analysis would be performed, based upon the screening model analysis. For example, additional analysis may be needed if projected emissions from a proposed development project exceed those utilized in the screening model analysis, or if proposed exploratory activity is within the distance from a Class I airshed for which the screening model identified potential impacts.

The Dixie National Forest Final EIS contains the type of detailed requirements we are recommending. These requirements are part of the construction and operating standards and are also incorporated into a lease notice to potential lessees. Because the Fishlake and Dixie National Forest leasing analyses both relied upon the same air quality modeling analysis, and the Dixie lease requirements were developed to address specific needs for additional information or added protection identified by the modeling analysis, the EPA had expected that these same leasing requirements would be applied in the Fishlake EIS. We recommend that the language from the Dixie National Forest Final EIS “Oil and Gas Construction and Operating Standards and Well Site Design Requirements” regarding air quality protection (item 41) be added to the Construction and Operation Standards for the Fishlake National Forest, and incorporated into the Fishlake Lease Notice, and that these additions appear in the Final EIS. This language would specify when additional project specific air impact analyses would need to be conducted in the future. It would also establish mitigation requirements including engine standards for internal combustion engines used in drilling and production operations as well as dust control

requirements.

As a general matter, it is important that the Forest Service ensure that mitigation requirements are consistent with the air modeling conducted. For example, non-road well pump engines should be required to meet or exceed Tier II emissions limits for particulate matter and Tier III emissions limits for NO_x and CO, as this is what was modeled.

2) Lack of Information regarding Potential Impacts to 1-Hour NO₂ and SO₂.

The air quality modeling performed for the Dixie and Fishlake National Forests does not address the 1-hour NO₂ and 1-hour SO₂ National Ambient Air Quality Standards (NAAQS), which were promulgated after the Forest Service completed the modeling. Because the EPA finalized the 1-hour NO₂ and 1-hour SO₂ NAAQS in April and August of 2010, respectively, these standards are applicable to the project and we recommend that compliance with the standards be analyzed in the Final EIS. One way to do so would be modeling to demonstrate compliance with the NAAQS; however, if the Forest Service can demonstrate, based on required mitigation or control measures, that the projected oil and gas activity would not result in exceedances of the 1-hour NO_x or 1-hour SO₂ standard, modeling at this time may not be necessary. If the Forest Service elects to make this demonstration instead of modeling, we recommend that the Final EIS include a description of the required mitigation measures, how those measures will be implemented, and the basis for the conclusion that the anticipated future development will not result in a substantial increase of these emissions.

The air quality modeling analysis completed by the Forest Service in February 2010 assumed the use of drilling rig engine emissions based on a Tier II engine standard. Consequently, the use of Tier II engines should be required as a minimum emission control to ensure that project impacts do not exceed those predicted in the screening analysis. However, if modeling of the 1-hour NO₂ NAAQS is not completed, we suggest requiring lower emitting Tier IV drill rigs (or their equivalent), which have more often shown compliance with the 1-hour NO₂ NAAQS in modeling we have reviewed for other air quality analyses. Requiring the use of Tier IV engines, compared to Tier II emissions, reduces NO_x emissions to a limit of 2.6 g/hp-hr. Also requiring the use of ultra-low sulfur diesel for all engines will minimize SO₂ emissions. Both of these commitments would help the Forest Service support a decision not to perform a quantitative air quality analysis to assess potential impacts to the 1-hour NO₂ and 1-hour SO₂ NAAQS.

3) The Draft EIS Does not Address Ozone or Cumulative Air Quality Impacts.

The potential impacts to ozone concentrations from leasing and development of oil and gas resources on the Fishlake National Forest were not analyzed in the modeling analysis. The Draft EIS indicates that, due to the small emissions levels of ozone precursors and the regional nature of the pollutant, ozone impacts will be addressed under cumulative effects. However, the Draft EIS does not include an air quality cumulative effects section. An assessment of the potential cumulative impacts of a proposed action in combination with other past, present, and reasonably foreseeable future development is a critical piece of disclosure through the NEPA process for any project. A disclosure of cumulative air quality impacts should therefore be added to the Final EIS.

Although ozone has not been identified as a concern in the project area, emissions from oil and gas development have contributed to ozone issues in other fields in the western United States. It is therefore

important that this NEPA analysis address the potential ozone impacts of the proposed action. We recommend a discussion in the Final EIS of potential ozone impacts that includes:

- Emissions inventory information for volatile organic compounds (VOCs) and nitrogen oxides (NO_x), which are ozone precursors;
- Ambient ozone data from monitors located in or near the Fishlake National Forest;
- Cumulative ozone modeling results from any representative photochemical grid modeling completed for another project with the appropriate modeling domain and future year for the Fishlake National Forest to determine the contribution of the projected oil and gas development; and
- A qualitative discussion of the potential contribution of the project to ozone concentrations that draws on these pieces of information.

Additionally, since the level of oil and gas exploration and development that may ultimately occur on leased lands within the Fishlake National Forest is not conclusively known, we recommend that the Final EIS include a commitment that the Forest Service will require future ozone analysis if oil and gas activity exceeds that projected in this EIS analysis, similar to the commitment in the Dixie Final EIS. We recommend that this requirement be included in a lease notice to alert future lessees of the potential need for ozone modeling.

4) Key Background Air Quality Information is Missing from the Draft EIS.

The Draft EIS does not present key information necessary to understand the potential impacts to air quality from oil and gas leasing and development on the Fishlake National Forest. We recommend adding a table showing the relevant NAAQS for comparison to the modeling results presented in Section 3.12.2. Further, we recommend including information on cumulative air impacts such as current monitoring information for air quality and air quality related values (AQRVs), criteria pollutant emissions, and existing emission sources in or near the Fishlake National Forest (for example, within Beaver, Garfield, Iron, Juab, Millard, Piute, Sanpete, Sevier and Wayne counties). This information is available from the State of Utah, Division of Air Quality. We recommend that the Air Quality Affected Environment section be updated in the Final EIS, using the Dixie National Forest Final EIS as a guide for the type of information that would be appropriate to include.

B. Water Resources

1) Disclosure of Current and Potential Drinking Water Sources

According to the Draft EIS, groundwater in the Forest has not been well characterized. However, understanding the quality of groundwater resources present in the project area is critical to understanding the potential for impacts. We recommend that the Final EIS disclose additional information characterizing the Forest's groundwater resources, including the following:

- Maps of the aquifers in the project area including formation names and depths;
- Identification of existing and potential underground sources of drinking water (USDW). USDWs include not only those formations that are presently being used for drinking water, but also those

that can reasonably be used in the future.¹

- The location and extent of the groundwater recharge areas; and,
- Identification of shallow and sensitive aquifers that are susceptible to contamination from surface activities.

The Draft EIS states that Drinking Water Source Protection Zones (DWSPZ) are sensitive information that cannot be shown on a map, yet it is EPA's experience that DWSPZs are typically shown on maps for NEPA analyses. This information is important to disclose the potential for impacts to drinking water resources. Domestic and stock watering wells, not mentioned in the Draft EIS, also warrant protection for water quality. We recommend that the Final EIS provide additional information on:

- Designated DWSPZs for groundwater or surface water resources;
- Water rights for public water systems;
- Domestic or stock watering wells, springs, or surface water intakes; and,
- Municipal Watersheds designated within the Forest.

We recommend that this information be provided in both a table and a map. We suggest contacting Mark Jensen (801-536-4199) of the Utah DEQ Division of Drinking Water with questions about DWSPZs. We advise that the Forest Service contact the Division of Drinking Water yearly or use their online database of DWSPZ layers to get the most current information, as zones are updated or added periodically.

2) Disclosure of Potential Impacts to Surface Water Quality

The Draft EIS includes a general discussion of the potential for impacts to surface water resources from sediment runoff associated with surface disturbance. The EPA recommends that the analysis of potential impacts be expanded to allow a broader consideration of the potential consequences of a leasing decision, since development authorized by the leasing decision could include development beyond the 73 wells currently predicted. Our detailed recommendations to improve disclosure of potential impacts to surface water quality are provided in Attachment 1.

The EPA is particularly concerned with the potential for water quality impacts to impaired waterbodies, including waterbodies listed on the Clean Water Act § 303(d) list and waterbodies with completed Total Maximum Daily Loads (TMDLs). If oil and gas development occurs on the Fishlake National Forest, it will constitute a new nonpoint source that may result in further impairment and the potential for additional violations of surface water quality standards and the Clean Water Act if additional pollutant loads reach these impacted waterbodies. We therefore request that the Forest Service explain in the Final EIS how oil and gas exploration and development may impact lakes and reservoirs with completed TMDLs and/or listed water quality impairments, for the specific pollutants listed. For example, in addition to sediment contributions already discussed in the Draft EIS, if nutrients are naturally occurring

¹ In general, this includes aquifers with a concentration of total dissolved solids (TDS) less than 10,000 mg/L and with a quantity of water sufficient to supply a public water system. Aquifers are presumed to be USDWs unless they have been specifically exempted or if they have been shown to fall outside the definition of USDW (e.g., over 10,000 mg/L TDS).

within the soils, surface disturbance may also exacerbate impairments for phosphorous and dissolved oxygen.

3) Stipulations to Protect Water Resources

Current and Potential Drinking Water Sources: The Forest Service has included an important NSO stipulation to protect DWSPZs in the Preferred Alternative. The NSO is specified to cover both municipal and transient groundwater protection zones. Source water protection is important because these essential water resources serve people that could be exposed to any contaminants in the water over a long period of time. Although there are no state-designated surface water protection zones currently within the Fishlake National Forest, such zones may be designated in the future. We suggest that the Forest Service consider expanding the NSO stipulation for DWSPZs to include surface water zones in case such zones are designated during the life of this planning document. The EPA also generally recommends NSO in Municipal Watersheds. Municipal Watersheds are designated based on their importance for community water supply. They are also designated for protection under the Fishlake National Forest's 1986 Land and Resource Management Plan. We recommend that an NSO stipulation be included in the Final EIS to protect the Municipal Watersheds, as has been required in previous Forest Service oil and gas leasing decisions including the Dixie National Forest Final EIS. Our specific recommendations for stipulations to avoid and protect sensitive drinking water resources are attached (See Attachment 2).

Streams, Reservoirs, Springs and Lakes: Oil and gas activities, including construction, drilling, well stimulation, pipelines, produced fluid storage and transport may result in the introduction of contamination into surface water and groundwater resources. The Preferred Alternatives includes an NSO stipulation for a 300-foot buffer around all perennial streams, reservoirs, springs and lakes, while Alternative D provides a 500-foot NSO buffer for these resources. While we recognize that the Preferred Alternative also includes an NSO restriction for slopes greater than 35%, which will help to prevent impacts associated with stormwater runoff, we believe that a valuable environmental benefit is gained by increasing the NSO buffer to 500 feet. In addition to reduced sedimentation, a setback of 500 feet also provides a greater travel time for any spills or leaks of contaminants at the well site before reaching surface water, allowing more time for clean-up of a potential spill. We also request that the Final EIS clarify whether construction of linear facilities (i.e., roads, pipelines, etc.) may still occur in this NSO area, and recommend avoidance of this area.

Wetlands and Riparian Areas: The Preferred Alternative includes NSO stipulations that prevent construction of well sites or production facilities in jurisdictional wetlands and riparian areas. We note that according to Executive Order 11990, federal agencies are required to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities, regardless of the Clean Water Act § 404 jurisdictional status of the wetlands. To this end, we recommend that the NSO stipulation be applied to protect all wetlands, regardless of their jurisdictional status.

We additionally suggest that the Forest Service consider enhancing this valuable protection by including a 500-foot buffer zone around these sensitive resources, similar to our recommendation for streams, reservoirs, springs and lakes. Addition of a buffer will help to prevent erosion and sedimentation impacts in sensitive soils, impacts to wetland plants in unique wetlands such as springs and seeps which

can be difficult to replace (e.g., compensatory mitigation through restoration or creation may not be feasible), or disturbance to surface or groundwater hydrology which could impact the viability of the wetlands. Further, we recommend avoiding construction of linear facilities in wetland and riparian areas, and ask that the Forest Service explain in the Final EIS what is meant by complying with “direction in the 1986 Fishlake National Forest Land and Resource Management Plan” in this regard.

Floodplains: The EPA recommends an NSO stipulation be added for floodplains. Well pad construction in floodplains is a serious risk that should be avoided, particularly due to the potential for flood damage to well-heads and associated production equipment that could result in leaks or spills of toxic materials to waterbodies. Executive Order 11988 Floodplain Management calls on Agencies to avoid to the extent possible the long and short term impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. There are several measures included in the Preferred Alternative that are likely to provide some protection for floodplains, including the stipulations for NSO in riparian areas, the 300-foot buffer zone for perennial streams, and the lease notice for protection of endangered fish of the Upper Colorado River drainage basin, which does not allow drilling to occur “within 100-year floodplains of rivers or tributaries to rivers that contain listed fish species or critical habitat.” However, to provide clear protection for this sensitive resource, we recommend development of a specific stipulation for NSO in all 100-year floodplains.

4) Mitigation and Monitoring to Protect Water Quality

The Draft EIS briefly discusses the use of BMPs to prevent potential impacts to water resources that could exist despite the NSO stipulations. However, the Draft EIS does not provide the specificity needed to assess the adequacy of the BMPs. The EPA suggests that the Forest Service provide this specificity by including additional information in the Final EIS on the types of BMPs the Forest Service plans to implement, including the circumstances under which the BMPs would be applied. Specifically, the EPA recommends the Final EIS include:

- A list of BMPs that may be required to protect surface water and groundwater resources;
- A discussion of the circumstances under which the BMPs would be applied (e.g., proximity to surface water resources, presence of erosive soils, slope, shallow water aquifers, proximity of water wells, etc.); and,
- An explanation of how the Forest Service would ensure that the BMPs would be monitored and enforced.

We have provided some general recommendations for mitigation measures to protect groundwater resources in Attachment 2.

We recommend that the Final EIS include a commitment that future project-level NEPA analyses for oil and gas development will contain a monitoring plan and program to track groundwater and surface water impacts as drilling and production operations occur. This will help to ensure the BMPs are mitigating the impacts from routine development activity, and will identify potential impacts associated with spills or leaks of hazardous materials. An essential component of future project-level monitoring is baseline and long-term monitoring for private wells. In the absence of groundwater modeling to determine the distance from the project at which impacts may occur, the EPA recommends the Forest

Service adopt a requirement for monitoring to occur in private wells within one mile of an oil and/or gas project area (the BLM Gasco Uinta Basin project in Utah and the Forest Service Eagle Prospect project in Wyoming are examples of where similar monitoring programs have been established). This monitoring will help assure mitigation measures are adequate and that water resources are being fully protected. Baseline groundwater monitoring may also be a useful means by which to identify the depths and extent of USDWs.

5) Freshwater Consumption

Well completion activities and enhanced oil recovery operations typically use freshwater. According to the Draft EIS, the majority of groundwater basins in the Forest are fully or almost fully appropriated and drawdown of groundwater levels is a potential concern in the project area. The EPA recommends reuse of produced water for these activities to reduce the use of drinking water resources and help ensure the long term sustainability of these operations. Other environmental benefits of reuse of produced water include:

- Reduced reliance on evaporation ponds which leads to:
 - reduced potential for ground water or surface water contamination; and
 - reduced air emissions (odor, volatile organic compounds, hazardous air pollutants).
- Reduced reliance on additional subsurface disposal (underground injection control (UIC) injection wells) which leads to associated energy and cost savings.

Further, because availability of freshwater could be a concern for future oil and gas development projects in the Forest, we recommend that the Final EIS specify that future multiple-well oil and gas projects will need a water resource management plan to address water consumption and produced water disposal, including identifying water recycling opportunities.

Conclusion and EPA's Rating

Consistent with Section 309 of the Clean Air Act, it is the EPA's responsibility to provide an independent review and evaluation of the potential environmental impacts of this project. In accordance with our policies and procedures for reviews under NEPA and Section 309 of the Clean Air Act, the EPA is rating this Draft EIS as "Environment Concerns – Insufficient Information" (EC-2). The "EC" rating indicates that our review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts. The "2" rating indicates that the Draft EIS does not contain sufficient information for the EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment. We have enclosed a description of the EPA's rating system for your convenience.

The EPA appreciates your continued willingness to accept input from us on this action. Pursuant to our numerous conversations over the course of the last six months, we are committed to working through our outstanding concerns with you, to the extent possible, before issuance of the Final EIS. We suggest having a meeting or conference call between our agencies to discuss these comments and our

recommended solutions. If you are interested in scheduling a meeting or have any questions about our letter, please contact me at (303) 312-6925. You may also contact Molly Vaughan, lead reviewer for this project, at (303) 312-6577 or by email at vaughan.molly@epa.gov.

Sincerely,



Suzanne J. Bohan
Director, NEPA Compliance and Review Program
Office of Ecosystems Protection and Remediation

Enclosures (3)



ATTACHMENT 1
EPA's Detailed Comments
Fishlake National Forest Oil and Gas Leasing Draft EIS

A. Air Quality

1. Clarification of Development Scenario Modeling Results.

It is unclear from the information presented in the Draft EIS which screening model scenario from the Modeling Report (Appendix D) forms the basis for the presented impacts, the 12-well directional drilling development, labeled the "Fishlake National Forest Development Scenario," or the 20-well conventional drilling development, labeled the "Dixie National Forest Development Scenario." The Draft EIS (Sections 3.12.2 and 3.12.3) appears to present pieces of information based on each of these scenarios. We recommend that the Forest Service confirm whether the 20-well or 12-well scenario, or both, is most representative of potential impacts from anticipated development in the Fishlake National Forest and explain why, and then consistently present the results throughout the Final EIS. Finally, please confirm that there is not an error with the modeling results presented in Table 3.12-7, which do not appear to match the Modeling Report for either the 20-well or 12-well scenario. If the Final EIS presents results that are not consistent with the Modeling Report, please explain the reason for the difference.

2. Correction of Construction Emissions

Table 3.12-4, "Construction Emissions," appears to contain an error in the presentation of Emission Rate information. The units for "Emission Rate" in the table are labeled as lb/hr; however, the rates for "Well Pad Construction1" and "Road2" match those in the Modeling Report in g/sec. Please correct the unit label to g/sec. Further, the rates presented for "Natural Gas Exploration Flare" do not match the Modeling report (either in g/sec or with the appropriate conversion to lb/hr). Please correct these emission rates if there was an error in transposing the information into the Draft EIS. If the emission rates are correct, please explain why the rates are different from those included in the Modeling Report.

B. Climate Change

The detailed evaluation of greenhouse gas (GHG) emissions and climate change provided in Appendix E is based on the Climate Change Report originally developed for the Dixie National Forest. Adjustments to the GHG emissions estimates were made by scaling those emissions based upon the RFD differences for the two Forests. Based on our review, we recommend changes to a few of the assumptions used in the emission adjustments. "Transportation of Final Product to End User" and "End Use" GHG emissions are set to be the same as the Dixie National Forest. Because both of these emission factors are based upon the volume of product transported or consumed it would make sense to increase these emissions by 34%, as was done for "Production Operations" and "Refining into Final Product," to reflect the anticipated additional production wells.

Additionally, we recommend that Table 3.12-8 of the Draft EIS be revised in the Final EIS to reflect the adjusted estimated emissions for the Fishlake National Forest presented in the introduction to Appendix E.

C. Water Resources

1. Protection of Wetlands

Section 3.8 – Soils of the Draft EIS states that 5,029 acres of lands within the forest are considered wetlands based on the presence of hydric soils. We recommend that Section 3.9 – Water Resources clarify whether this acreage matches that of any wetland mapping (i.e., National Wetlands Inventory) that has been performed in the Forest, and that a map of wetlands be provided in the Final EIS.

2. Impacts to Surface Water Quality.

To improve understanding of potential impacts to surface water quality, we suggest the following:

- In Table 3.9-1 – “Fishlake National Forest streams and reservoirs on the approved 303(d) list” and Table 3.9-2 – “Streams and reservoirs on the completed Total Maximum Daily Load (TMDL) list (2011) and 305(b) category (2006)” include the designated uses for listed lakes and reservoirs, as well as the pollutants requiring reductions in the completed TMDLs. The inclusion of this readily available information will provide a more complete understanding of the types of cumulative impacts to water and water uses in the Fishlake National Forest that may be affected by oil and gas activity.
- Include a summary discussion in the Final EIS that quantifies water resources present in the Forest (i.e., miles of streams, acreage of lakes, acreage of riparian areas and number of springs). The addition of this information, in addition to the excellent mapping of water resources and vegetation, will help to complete the general discussion of the potential for impacts to such resources.

ATTACHMENT 2
Recommended Groundwater and Surface Water Protection Measures
Fishlake National Forest Oil and Gas Leasing Draft EIS

The EPA recommends that the Forest Service develop lease stipulations designed specifically to protect current and future drinking water resources under this EIS. This will take advantage of an important opportunity to avoid and mitigate potential significant impacts of water resources within the planning area. The EPA recommends that the Forest Service consider requiring oil and gas operators to follow the measures below in the Final EIS to protect ground and surface waters. EPA developed these recommendations based on the State of Utah's "Water Source Protection Guide for Surface Water Users" (November 2005) and "Ground Water Source Protection User's Guide" (September 2011) and in consideration of the BLM's Instructional Memorandum UT 2010-055 Protection of Groundwater Associated with Oil and Gas Leasing, Exploration, and Development. We provide these recommendations with the understanding that their appropriateness will depend on the location of development activity relative to sensitive water resources and knowledge that their applicability should be evaluated carefully to avoid inadvertently creating unintended environmental impacts.

- Sole Source Aquifers (if designated in the future):
 - No Leasing.
- Source Water Protection Areas and Well Head Protection Areas:
 - No Surface Occupancy in Municipal Watersheds.
 - No Surface Occupancy in Groundwater Zones 1-3 for Community Water Supplies.
 - No Surface Occupancy in Groundwater Zones 1-2 for Transient groundwater systems.
 - No Surface Occupancy in Surface Water Zones 1-2 for both Community Water Supplies and Transient systems.
 - If No Surface Occupancy stipulations are not required for the zones above, impose Controlled Surface Use Stipulations within Municipal Watersheds, Groundwater Zones 1-3 and Surface Water Zones 1-2 including but not limited to:
 - Closed loop drilling systems;
 - Line surface impoundments (evaporation ponds or drilling pits) with synthetic liners and subsequently decommission by removing all contaminants and liner and reclaiming the area with natural vegetation, and disposing of the liners in approved waste management facility or recycling them;
 - Identify private wells and set stipulations to be protective (e.g., no surface occupancy within immediate (defined by Forest Service) area, collect baseline data on groundwater, long-term monitoring, replacement of water supply if contaminated, etc.).
 - In leases already permitted but not drilled, impose Conditions of Approval for APDs including but not limited to the Controlled Surface Use Stipulations listed above.
- For areas with unconfined shallow groundwater (as determined by viewing well logs and available geological information) consider:
 - No Surface Occupancy;
 - Prohibit or restrict use of evaporation ponds in proximity to shallow aquifers;

- Review the geology of shallow aquifers to determine well construction requirements, which may include cementing to surface and drilling with a fresh water mud system.
- General recommendations for standard lease stipulations/best management practices:
 - A well design requirement to set surface casing and cement to a specific formation or depth if there are underlying USDWs.
 - Surface casing needs to be below the lowermost USDW and set into a confining (e.g., shale) layer.
 - A requirement for an intermediate string of casing and cement may be appropriate in the event of encountering very deep aquifers.
 - Specify in the Final EIS that future multiple-well oil and gas projects will need a water resource management plan to address water consumption and produced water disposal, including identifying water recycling opportunities.
 - Specify in the Final EIS that future multiple-well oil and gas projects will need a Baseline and Long-Term Water Quality Monitoring Plan (the U.S. Forest Service Eagle Prospect project in Wyoming and the BLM Gasco Uinta Basin project in Utah are examples where similar monitoring plans have been established).
- General Recommendations for surface water protection
 - No Surface Occupancy for 100-year floodplains.
 - No Surface Occupancy within 500 feet of wetlands and riparian zones.
 - No Surface Occupancy within 500 feet of perennial water bodies.

